Amendment to the Claims:

        1-2.   (Canceled)

        3.   (Currently amended) ~~Apparatus according to claim 1, characterized in that~~ An apparatus for navigating an instrument through an anatomical structure of a patient's body volume, the apparatus comprising:

a table for supporting the patient;

at least a first C-arm having a first X-ray source and a first X-ray detector configured to acquire a first series of 2D-images of the instrument while manoeuvering through said anatomical structure; and

a processing unit connected to a memory device, the memory device configured to hold pre-determined 3D-images of the patient's anatomical structure, and the processing unit configured to process the 2D-images of the instrument and the 3D-images of the anatomical structure to provide merged 3D-images of the instrument manoeuvering through said anatomical structure, the processing unit performing a 2D-3D registration to relate coordinates of the 2D-images of the instrument to coordinates of the 3D-images of the anatomical structure prior to providing the merged 3D-images of the instrument and the anatomical structure;

wherein the memory device holds a pre-determined 3D-model representation of the instrument; and ~~that~~

wherein the processing unit is ~~arranged~~ configured to: ~~carry out~~

perform a 2D-3D registration to relate the coordinates of the 3D-model representation with the coordinates of the 2D-images of the instrument, ~~and that the processing unit is further arranged to~~

calculate projections of the 3D-model representation to generate 2D-model images of the instrument corresponding to the acquired 2D-images of the instrument, ~~and to~~

modify the 3D-model representation ~~into an adapted 3D-model representation~~ in order to

optimize matching of the 2D-model images to the acquired 2D-images of the instrument <u>to derive an adapted 3D-model representation</u>, and ~~that   the processing unit is further arranged to~~

merge the adapted 3D-model representation of the instrument with the 3D-images of the anatomical structure <u>to provide the merged 3D-images of the instrument manoeuvering through said anatomical structure</u>.

4. (Currently amended) ~~Apparatus~~ <u>The apparatus</u> according to claim 3, ~~characterized in that it comprises~~ <u>further comprising</u>:

a second C-arm with a second X-ray source and a second X-ray detector for acquiring a second series of 2D-images simultaneously with the first series of 2D-images~~; and that~~

<u>wherein</u> the processing unit is ~~arranged~~ <u>configured</u> to<u>:</u>

~~carry out the registration of~~ <u>register</u> the coordinates of the 3D-model representation ~~in respect of~~ <u>respective to</u> both the first series and the second series of 2D-images of the instrument~~, and that the processing unit is arranged to~~

derive ~~thereafter   an~~ <u>the</u> adapted 3D-model representation of the instrument based on both the first series and the second series of 2D-images of the instrument, and ~~to~~

~~merge   this   adapted   3D-model representation with the 3D-images of the anatomical structure~~.

5-6. (Canceled)

7.   (Currently amended) ~~Method according to claim 5, characterized in that~~ A method for navigating an instrument through an anatomical structure of a patient's body volume, the method comprising:

acquiring a first series of 2D-images of the instrument while maneuvering the instrument through the anatomical structure;

acquiring a 3D-model representation of the instrument; and ~~is acquired and is registered~~

processing the 2D-images of the instrument and 3D-images of the patient's anatomical structure to generate merged 3D-images of the instrument manoeuvering through the anatomical structure, wherein the 2D-images of the instrument are registered with the 3D-images of the anatomical structure prior to generating the merged 3D-images of the instrument and the anatomical structure, wherein the processing includes:

registering the acquired 3D-model representation of the instrument with the 2D-images of the instrument, ~~and in that~~

deriving 2D-model images of the instrument ~~are derived~~ from said 3D-model representation, the 2D-model images corresponding to the acquired 2D-images of the instrument, ~~and that~~

adapting said 3D-model representation ~~is adapted~~ to optimize ~~the~~ matching of the derived 2D-model images with the acquired 2D-images of the instrument, the adapting generating an adapted 3D-model representation of the instrument, and

~~prior to~~ merging the adapted 3D-model representation of the instrument with the 3D anatomical structure to generate the merged 3D-images of the instrument manoeuvering through the anatomical structure.

8.   (Currently amended) ~~Method~~ The method according to claim 7, ~~characterized in that~~ further comprising:

acquiring a second series of 2D-images ~~is acquired~~ simultaneously with the acquiring of the first series of 2D-images of the instrument, the second series of 2D-images being acquired ~~but~~ from a different angle compared with the first series of 2D images, ~~and that a~~ wherein:

the registering includes registering ~~registration is carried out of~~ the coordinates of the 3D-model representation of the instrument ~~in respect of~~ respective to both the first series and the second series of 2D-images of the instrument, and ~~whereafter~~

the adapting includes adapting the 3D-model representation of the instrument ~~is adapted~~ to optimize the matching of said first series and second series of images of the instrument with 2D-model images of the instrument derived from said 3D-model representation~~, and that thereafter~~

~~the adapted 3D-model representation of the instrument is merged with the 3D anatomical structure.~~

9-10.   (Canceled)

11.   (Currently amended) ~~Software according to claim 9, characterized in that execution thereof causes the computer to~~ A computer readable medium having, stored thereon, computer executable software for navigating an instrument through an anatomical structure of a patient's body volume, the software comprising instructions for causing a computer to implement the steps of:

acquiring a first series of 2D-images of the instrument while manoeuvering through the anatomical structure; and

processing the 2D-images of the instrument and 3D-images of the patient's anatomical structure to generate merged 3D-images of the instrument manoeuvering through the anatomical structure, the processing including:

registering the 2D-images of the instrument with the 3D-images of the anatomical structure by registering a register an acquired 3D-model representation of the instrument with the 2D-images of the instrument,

deriving to derive 2D-model images of the instrument from said 3D-model representation, the 2D-model images corresponding to the acquired 2D-images of the instrument, and

adapting to adapt said the 3D-model representation in order to optimize the matching of the 2D-model images with the acquired images of the instrument to generate an adapted 3D-model representation of the instrument, and

prior to merging the adapted 3D-model representation of the instrument with the 3D anatomical structure to generate merged 3D-images of the instrument manoeuvering through the anatomical structure.

12. (Currently amended) Software The software stored on the computer readable medium according to claim 11, arranged for processing a wherein said first series of 2D-images of the instrument and a second series of 2D-images of the instrument that are acquired simultaneously, but from a different angle, by the acquiring step, and wherein: characterized in that execution thereof causes the computer to carry out a

the registering includes registering registration of the coordinates of the 3D-model representation of the instrument in respect of respective to both the first series and the second series of 2D-images of the instrument, and

the adapting includes adapting ~~to subsequently adapt~~ the 3D-model representation of the instrument in order to optimize the matching of said first series and second series of images of the instrument with 2D-model images of the instrument derived from said 3D-model representation~~, and~~

~~merging to merge thereafter the adapted 3D-model representation of the instrument with the 3D anatomical structure~~.

13. (Canceled)

14. (New) A method comprising:

processing 2D-images of an instrument acquired from one or more viewing angles during maneuvering of the instrument through an anatomical structure of a patient's body volume to generate 3D-images of the instrument manoeuvring through the anatomical structure, the processing including:

registering a 3D-model representation of the instrument and the acquired 2D-images of the instrument,

projecting the 3D-model representation to derive 2D-model images of the instrument from the one or more viewing angles, and

adapting the 3D-model representation to optimally match the projected 2D-model images and the acquired 2D-images of the instrument.

15. (New) The method as set forth in claim 14, wherein the 2D-images of the instrument are acquired from two different viewing angles during the maneuvering of the instrument through the anatomical structure of the patient's body volume.

16. (New) The method as set forth in claim 14, further comprising:

maneuvering the instrument through the anatomical structure of the patient's body volume; and

during the maneuvering, acquiring the 2D-images of the instrument from one or more viewing angles.

17.   (New) The method as set forth in claim 14, wherein the adapting generates an adapted 3D-model representation of the instrument and the 3D-images of the instrument manoeuvering through the anatomical structure comprise at least the adapted 3D-model representation of the instrument.

18.   (New) The method as set forth in claim 14, wherein the adapting generates an adapted 3D-model representation of the instrument and the processing further includes:

merging   the   adapted   3D-model representation of the instrument and a 3D anatomical structure to generate the 3D-images of the instrument manoeuvering through the anatomical structure.

19.   (New) The method as set forth in claim 14, wherein the processing includes iteratively repeating the projecting and the adapting to iteratively optimize the match of the projected 2D-model images and the acquired 2D-images of the instrument.

20.   (New) A computer readable medium having, stored thereon, computer executable software comprising instructions for causing a computer to perform the method of claim 14.